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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/583,970 | 06/22/2006 | Hirofumi Yasuda | 040302-0570 | 8384 |
| 22428 7590 06/10/2009 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007 | | | EXAMINER WOOD, JARED M | |
| | | | ART UNIT 1793 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/583,970

Applicant(s)

YASUDA ET AL.

Examiner

JARED WOOD

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-19 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The final action previously mailed on 04/28/2009 has been withdrawn in and is replaced by the current action. The previous action has been withdrawn because the examiner failed to address all of the currently pending claims. A new statutory period for response will begin on the mailing date of this action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,714,693 (Targos) in view of Training Papers Spray Drying (BUCHI Labortechnik AG, hereafter referred to as Buchi) and US 7,022,642 (Yamamoto).

As to claim 1, Targos teaches a method of making a catalyst composition where a reverse micelle emulsion used to provide isolated micelles of a metal ion containing solution (col. 3, ln. 26) where the metal ions can comprise singly, or in any combination, group VIII metals such as platinum, ruthenium, and palladium (noble metals), group IB-VIIIB metals (transition metals such as Cu, Mn Co, Fe, Ni, and Zn), and Lanthanides such as lanthanum and cerium (col. 5, ln. 25 and examples II-IV) **which also reads on claims 3, and 6-8**. The micelles are impregnated onto/into an inorganic oxide particular carrier such as alumina (col. 6, ln. 19) (to form a catalyst precursor) **which also reads on claim 4**. The new emulsion with the carrier particles is air dried and then fired in air to oxidize the residual organics and carbonaceous deposits from the solvent and surfactant(s) (col. 6, ln. 42).

Targos does not expressly teach spraying the catalyst precursor in an inert gas to dry the catalyst precursor or reducing the catalytic metal(s) prior to carrying on the substrate.

Buchi teaches the use of spray drying as a widely applied technique for quickly drying "aqueous or organic solutions, emulsions etc." (pg. 2, ¶ 1). Buchi further teaches the use of a closed cycle spray drying system which typically uses an inert gas such as nitrogen in

applications where “flammable solvents, toxic products or oxygen sensitive products are processed” (pg. 4, ¶ 2).

At the time of the invention, it would have been obvious to use the spray drying system taught by Buchi to dry the catalyst precursor taught by Targos to quickly dry the precursor without losing control of processing temperatures and conditions caused by rapid combustion of the solvent and/or the surfactant in the solution. The motivation for doing so would have been to accelerate the processing time by avoiding a slow air dry while maintaining control over the processing temperatures in catalyst production.

Yamamoto teaches a method of manufacturing an electrocatalyst comprising: preparing a first reversed micellar solution containing an aqueous solution of a noble metal ion; reducing the noble metal ion to a noble metal by adding a reducing agent to the first reversed micellar solution; preparing a second reversed micellar solution containing an aqueous solution of a transition metal ion; preparing a transition metal from the transition metal ion by adding a precipitant to the second reversed micellar solution; and loading a complex metal particle composed of the noble metal and the transition metal on a support (col. 2, ln. 25).

It would have been obvious to one of ordinary skill in the art at the time of invention to reduce the catalytic metal(s) prior to carrying on the substrate as taught by Yamamoto in the process of Targos. The motivation for doing so would have been to adjust a size of metal particles precipitated, thus making it possible to prepare catalyst particles made more finely. In addition, use of a reversed micellar solution makes it possible to load the catalyst particles on a surface of the support at an approximately equal interval (col. 4, ln. 3).

As to claim 2, Targos also teaches the use of a weight ratio range of surfactant to water of about 0.2:1 to 40:1 (col. 4, ln. 15) which, when using a solvent such as polyethylene glycol dodecyl ether, constitutes a molar ratio range of water to surfactant of 0.5:1 to 100:1. The claimed molar ratio of water to surfactant of 20:1 is well within this range and would be an obvious optimization of the range taught in the prior art (See MPEP § 2144.05).

As to claims 9 and 10, the catalyst obtained by the obvious process is likewise, considered to be obvious. It is noted that **Claim 10** is patentably identical to claim 9 and will, therefore, be considered jointly with claim 9.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Targos in view of Buchi and US 7,022,642 (Yamamoto) as applied to claims 1-4 and 6-10 above, and further in view of US 6,413,489 (Ying et al.).

The process of Targos does not teach the step of carrying comprising preparing a hydroxide to be matured into an oxide forming the substrate and clathrating (surrounding) the catalytic active component by the prepared hydroxide.

Ying teaches the use of aluminum isopropoxide and barium isopropoxide to produce aluminum and barium hydroxides emulsions (col. 7, ln. 36, and example 2) for use as a carrier for a water-in-oil emulsion to form the catalyst precursor (col. 8, ln. 48). This method yields a high level of control of the particle size of the precursor.

At the time of invention, it would have been obvious to use the hydroxide carrier formation technique taught by Ying to control the particle size of the product taught by Targos. The motivation for doing so would be to produce particles of a significantly uniform size while

avoiding costly and time consuming milling operations that result in particles of a substantially non-uniform size.

Allowable Subject Matter

Claims 11-19 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The best prior art, US 7,022,642 (Yamamoto), does not disclose or suggest reduction of the noble metal in solution 1 and precipitation of the transition metal in solution 2 both prior to mixing solutions 1 and 2. This claimed feature would result in a differently structured catalyst than that taught by Yamamoto.

Response to Arguments

Applicant's arguments filed 02/17/2009 have been fully considered but they are not persuasive.

Applicant's arguments with respect to claims 1 and 3-9 have been considered but are moot in view of the new ground(s) of rejection. Applicant has added the step of reducing the catalytic metal inside the reverse micelle prior to carrying on the substrate. This amendment requires new grounds of rejection, which are as follows:

Claims 1-4 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,714,693 (Targos) in view of Training Papers Spray Drying (BUCHI Labortechnik AG, hereafter referred to as Buchi) and US 7,022,642 (Yamamoto).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Targos in view of Buchi and US 7,022,642 (Yamamoto) as applied to claims 1-4 and 6-10 above, and further in view of US 6,413,489 (Ying et al.).

Applicant's argument with respect to claim 2 have been considered but are not persuasive. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); In re Geisler, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997), MPEP § 2144.05.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARED WOOD whose telephone number is (571)270-5911. The examiner can normally be reached on Monday - Friday, 7:30 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JARED WOOD/
Examiner, Art Unit 1793

/J.A. LORENZO/
Supervisory Patent Examiner, Art Unit
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